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CARTER, P.J.
MERCHANT, A.M.
PRESTA, L.G.

<120> METHOD FOR MAKING MULTISPECIFIC ANTIBODIES HAVING HETEROMULTIMERIC AND COMMON COMPONENTS

<130> P1099C1

<140> US 09/373,403
<141> 1999-08-12

<150> US 08/850,058
<151> 1997-05-02

<160> 26

<210> 1
<211> 36
<212> DNA
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<220>
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<400> 1
ctcttcccga gatgggggca gggtgcacac ctgtgg 36

<210> 2
<211> 21
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<220>
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<400> 2
ctcttcccga catgggggca g 21

<210> 3
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<220>
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<400> 3
ggtcatctca caccgggatg g 21
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<211> 24
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<220>
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<400> 4
cttggtcata cattcacggg atgg 24

<210> 5
<211> 30
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<220>
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<400> 5
ctcttcccga gatgggggac aggtgtacac 30

<210> 6
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<212> DNA
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<220>
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<400> 6
gccgtcggaa cacagcacgg g 21

<210> 7
<211> 39
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<400> 7
ctgggagtct agaacgggag gcgtggtaca gtagttgtt 39

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<211> 33
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<220>
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<400> 8
gtcggagtct agaacgggag gacaggtctt gta 33

<210> 9
<211> 21
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<220>
<223> mutant

<400> 9
gtcggagtct agacagggag g 21

<210> 10
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<220>
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<400> 10
gccgtcggag ctcagcacgg g 21

<210> 11
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<212> DNA
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<220>
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<400> 11
gggaggcgtg gtgctgtagt tgtt 24

<210> 12
<211> 38
<212> DNA
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<220>
<223> mutant

<400> 12
gttcaggtgc tgggctcggt gggcttgtgt gagttttg 38

<210> 13
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<220>
<223> mutant

<400> 13
aacgcgtacg ctctgaaaat ggcggacccg aaccgttttc gtggtaaaga 50

tctggctgca cactacggcc agccgcggga acctcaggtg tataccctgc 100

caccgtctcg agaagaaatg actaaaaacc aggtctctct gtggtgcctg 150

gtcaaaggtt tctatccgag cgatatcgcc gtggaatggg aaagcaacgg 200

tcaaccggaa aacaactaca aaaccactcc accggtgctg gattctgatg 250

gctccttctt tctgtattcg aagctgaccg ttgacaaaag ccgttggcag 300

caaggcaacg ttttcagctg ttctgttatg cacgaggcct tgcacaacca 350

ctacacccag aaaagcctgt ccctgtctcc cgggaaataa gctgaggctc 400

ctctagaggt tgaggtgatt ttatgaaaaa gaatatcgca tttcttcttg 450

catctatgtt cgtttttttct attgctacaa acgcgtacgc tgggcagccc 500

cgagaaccac aggtgtacac cctgccccca tcccgggaag agatgaccaa 550

gaaccaggta agcttgtact gcctggtcaa aggcttctat cccagcgaca 600

tcgccgtgga gtgggagagc aatgggcagc cggagaacaa ctacaagacc 650

acgcctcccg tgctggactc cgacggctcc ttcttcctct acagctttct 700

caccgtcgac aagagcaggt ggcagcaggg gaacgtcttc tcatgctccg 750

tgatgcatga ggctctgcac aaccactaca cgcagaagag cctctccctg 800

tctccgggta aatagggggcc c 821

<210> 14
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<220>
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<400> 14
Ser Asn Arg Phe Ser Gly Ser Lys Ser Gly Asn Thr Ala Ser Leu
1 5 10 15

Thr Ile Ser Gly Leu Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys
20 25 30

Ser Ser Tyr Thr Thr Arg Ser Thr Arg Val Phe Gly Gly Gly Thr
35 40 45

Lys Leu Thr Val Leu
50

<210> 15
<211> 50
<212> PRT
<213> Artificial sequence

<220>
<223> recombinant

<400> 15
Ser Asn Arg Phe Ser Gly Ser Lys Ser Gly Asn Thr Ala Ser Leu
1 5 10 15

Thr Ile Ser Gly Leu Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys
20 25 30

Ser Ser Tyr Thr Thr Arg Ser Thr Arg Val Phe Gly Gly Gly Thr
35 40 45

Lys Leu Thr Val Leu
50

<210> 16
<211> 50
<212> PRT
<213> Artificial sequence

<220>
<223> recombinant

<400> 16
Ser Asn Arg Phe Ser Gly Ser Lys Ser Gly Asn Thr Ala Ser Leu
1 5 10 15

Thr Ile Ser Gly Leu Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys
20 25 30

Ser Ser Tyr Thr Thr Arg Ser Thr Arg Val Phe Gly Gly Gly Thr
35 40 45

Lys Leu Thr Val Leu
50

<210> 17
<211> 50
<212> PRT
<213> Artificial sequence

<220>

<223> recombinant

<400> 17
Ser Asn Arg Phe Ser Gly Ser Lys Ser Gly Asn Thr Ala Ser Leu
1 5 10 15

Thr Ile Ser Gly Leu Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys
20 25 30

Ser Ser Tyr Thr Thr Arg Ser Thr Arg Val Phe Gly Gly Gly Thr
35 40 45

Lys Leu Thr Val Leu
50

<210> 18
<211> 50
<212> PRT
<213> Artificial sequence

<220>
<223> recombinant

<400> 18
Ser Asn Arg Phe Ser Gly Ser Lys Ser Gly Asn Thr Ala Ser Leu
1 5 10 15

Thr Ile Ser Gly Leu Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys
20 25 30

Ser Ser Tyr Thr Thr Arg Ser Thr Arg Val Phe Gly Gly Gly Thr
35 40 45

Lys Leu Thr Val Leu
50

<210> 19
<211> 50
<212> PRT
<213> Artificial sequence

<220>
<223> recombinant

<400> 19
Ser Asn Arg Phe Ser Gly Ser Lys Ser Gly Ser Thr Ala Ser Leu
1 5 10 15

Thr Ile Ser Gly Leu Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys
20 25 30

Ser Ser Tyr Thr Thr Arg Ser Thr Arg Val Phe Gly Gly Gly Thr

35 40 45

Lys Leu Thr Val Leu
50

<210> 20
<211> 50
<212> PRT
<213> Artificial sequence

<220>
<223> recombinant

<220>
<221> unsure
<222> 9
<223> unknown amino acid

<400> 20
Ser Asn Arg Phe Ser Gly Ser Lys Xaa Gly Asn Thr Ala Ser Leu
1 5 10 15

Thr Ile Ser Gly Leu Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys
20 25 30

Ser Ser Tyr Thr Thr Arg Ser Thr Arg Val Phe Gly Gly Gly Thr
35 40 45

Lys Leu Thr Val Leu
50

<210> 21
<211> 50
<212> PRT
<213> Artificial sequence

<220>
<223> recombinant

<400> 21
Ser Asn Arg Phe Ser Gly Ser Lys Ser Gly Asn Thr Ala Ser Leu
1 5 10 15

Thr Ile Ser Gly Leu Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys
20 25 30

Ser Ser Tyr Thr Thr Arg Ser Thr Arg Val Phe Gly Gly Gly Thr
35 40 45

Lys Leu Thr Val Leu
50

<210> 22
<211> 50
<212> PRT
<213> Artificial sequence

<220>
<223> recombinant

<400> 22
Ser Asn Arg Phe Ser Gly Ser Lys Ser Gly Asn Thr Ala Ser Leu
1 5 10 15

Thr Ile Ser Gly Leu Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys
20 25 30

Ser Ser Tyr Thr Thr Arg Ser Thr Arg Val Phe Gly Gly Gly Thr
35 40 45

Lys Leu Thr Val Leu
50

<210> 23
<211> 122
<212> PRT
<213> Artificial sequence

<220>
<223> recombinant

<400> 23
Gln Val Gln Leu Val Gln Ser Gly Gly Gly Leu Val Gln Pro Gly
1 5 10 15

Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser
20 25 30

Ser Tyr Glu Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu
35 40 45

Glu Trp Val Ser Gly Ile Ser Gly Ser Gly Gly Ser Thr Tyr Tyr
50 55 60

Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser
65 70 75

Lys Asn Thr Leu Tyr Leu Gln Met Asn Arg Leu Arg Ala Glu Asp
80 85 90

Thr Ala Val Tyr Tyr Cys Ala Arg Asp Asn Gly Trp Glu Leu Thr
95 100 105

Asp Trp Tyr Phe Asp Leu Trp Gly Arg Gly Thr Met Val Thr Val

110 115 120

Ser Ser

<210> 24
<211> 123
<212> PRT
<213> Artificial sequence

<220>
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<400> 24
Glu Val Gln Leu Val Glu Ser Gly Pro Gly Leu Val Lys Pro Ser
1 5 10 15

Gln Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Gly Ser Ile Ser
20 25 30

Ser Gly Gly Tyr Tyr Trp Ser Trp Ile Arg Gln His Pro Gly Lys
35 40 45

Gly Leu Glu Trp Ile Gly Tyr Ile Tyr Tyr Ser Gly Ser Thr Tyr
50 55 60

Tyr Asn Pro Ser Leu Lys Ser Arg Val Thr Ile Ser Val Asp Thr
65 70 75

Ser Lys Asn Gln Phe Ser Leu Lys Leu Ser Ser Val Thr Ala Ala
80 85 90

Asp Thr Ala Val Tyr Tyr Cys Ala Arg Val Asp Leu Glu Asp Tyr
95 100 105

Gly Ser Gly Ala Ser Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr
110 115 120

Val Ser Ser

<210> 25
<211> 107
<212> PRT
<213> Artificial sequence

<220>
<223> recombinant

<400> 25
Asp Ile Gln Met Thr Gln Ser Pro Ser Thr Leu Ser Ala Ser Ile
1 5 10 15

Gly Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Glu Gly Ile Tyr
20 25 30

His Trp Leu Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys
35 40 45

Leu Leu Ile Tyr Lys Ala Ser Ser Leu Ala Ser Gly Ala Pro Ser
50 55 60

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile
65 70 75

Ser Ser Leu Gln Pro Asp Asp Phe Ala Thr Tyr Tyr Cys Gln Gln
80 85 90

Tyr Ser Asn Tyr Pro Leu Thr Phe Gly Gly Gly Thr Lys Leu Glu
95 100 105

Ile Lys

<210> 26
<211> 261
<212> PRT
<213> Artificial sequence

<220>
<223> mutant

<220>
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<222> 130, 261
<223> unknown amino acid

<400> 26
Asn Ala Tyr Ala Leu Lys Met Ala Asp Pro Asn Arg Phe Arg Gly
1 5 10 15

Lys Asp Leu Ala Ala His Tyr Gly Gln Pro Arg Glu Pro Gln Val
20 25 30

Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val
35 40 45

Ser Leu Trp Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
50 55 60

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr
65 70 75

Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser

80 85 90

Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe
95 100 105

Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln
110 115 120

Lys Ser Leu Ser Leu Ser Pro Gly Lys Xaa Met Lys Lys Asn Ile
125 130 135

Ala Phe Leu Leu Ala Ser Met Phe Val Phe Ser Ile Ala Thr Asn
140 145 150

Ala Tyr Ala Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro
155 160 165

Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Tyr Cys
170 175 180

Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu
185 190 195

Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val
200 205 210

Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Phe Leu Thr Val
215 220 225

Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val
230 235 240

Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
245 250 255

Leu Ser Pro Gly Lys Xaa
260